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ABSTRACT

This study attempted to identify maternal variables within social class which were predictive of child status over time. Data on patterns of mother/child interactions were collected for the experimental and control groups of poverty mother/child dyads at the Frank Porter Graham Child Development Center and a group of general population high education and occupational status mother/child dyads. The measures employed included: (1) The Wechsler Adult Intelligence Scale or the Wechsler Intelligence Scale for Children and the High Risk Index administered prenatally; (2) a 25-minute laboratory observation of mother/child dyads in free play sessions conducted at 6 and 20 months; (3) the Caldwell Home Observation for Measurement of the Environment (HOME), administered in the subjects' own homes at 6 and 18 months; and (4) an adaptation of the Parental Attitudes Research Inventory (PARI), administered at 6 and 18 months. Results showed clear differences in the attributes of middle class and poverty mothers, with the general population mothers talking and interacting more with their infants and toddlers, scoring higher on all subscales of the Home Stimulation Inventory, and scoring as less authoritarian, more democratic, and more hostile and rejecting than the poverty mothers. It was concluded that within the poverty groups, day care intervention did alter the relationship between maternal variables and child status so that maternal variables were highly predictive of child status for the control group and less so for the experimental group. (JMB)

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Social Interactions of Mothers and Young Children: Implications for Development

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The general relationship between poverty and child status has been clearly demonstrated both by data collected at the Frank Porter Graham Center and by previous research (Deutsch, Katz, and Jensen, 1968; Golden, Birns, Bridger, and Moss, 1971; Mosteller, and Moynihan, 1972). Poverty has a debilitating effect on child status as measured by standard intelligence tests and school achievement. It is also generally assumed that parents, particularly mothers in predominantly single-parent samples such as ours, are the mediators of the effects of social class; they transmit the effects either through their behaviors with their children, their attitudes toward their children or perhaps the way in which they organize their homes.

In the longitudinal project at Frank Porter Graham we have collected extensive information about the mothers whose children are being followed either in the control or the experimental group. We were interested in such data for two primary reasons: first because there was concern that an early intervention program which placed children in a daycare setting for major parts of the day might achieve cognitive gains at the expense of seriously altering the mother-child relationship. The results of three years of data on the first two groups of children indicate that the mother-child relationship is not being disrupted or even altered very much from what it would have been had the children not been placed in daycare. What differences there are between

experimental and control children on a variety of mother behaviors and attitudes favor the experimental mothers. We have discussed these findings in previous publications and papers and they are not the major focus of this presentation.

Our second major reason for collecting information on the mothers of the children in the project represents an attempt to identify predictors within social class which are related to child status over time. This goal addresses the issue of the way in which the effects of social class are being transmitted. Many children in poverty situations do not become functionally retarded; in fact, the majority do not. The question is, then, how are these children different from those who do become retarded? Are there attributes we can identify about the mother's behavior, her attitudes, or her at-home involvement with the child which are predictive of the child's later success, at least as measured by a standard intelligence test?

Information about the mothers is collected in four major domains as outlined in Table 1. Let me describe each of these domains in more detail. Before the birth of her child the mother is administered the WAIS, and the High Risk Index is completed. The High Risk Index has been discussed previously by Craig Ramey and is in Table 1 of his introductory remarks.

The laboratory observations of dyadic interaction to be talked about today took place when infants were 6 and 20 months in an experimental room at the FPG Center which had a videotape camera mounted in one corner. The room contained a couch, a chair, a television, and a

small table and lamp and magazines for the mother. At 6 months, a crib was included in the room. At each age, a set of developmentally appropriate toys was provided.

The mother was instructed that we were interested in the activity level of the child and his play with toys and with his mother. Observations lasted 25 minutes.

Fifty-five experimental and control children at age 6 months were observed with their mothers. Fifty-two children at age 20 months were observed with their mothers. Fifty children were seen at both the 6 and 20-months observational sessions. Scored from the videotapes for both duration and frequency were measures of the mother talking to her child, demonstrating a toy and touching or holding the child. In addition, we scored measures of mother and child in mutual interaction, mother reading to herself and child playing alone. Observer agreement within categories ranged from 75 - 100%.

The Home Observation for Measurement of the Environment (HOME) developed by Caldwell (1970) was administered in the homes of 56 high-risk children at 6 months and 53 at 18 months. This inventory consists of 43 items representing six factors, listed in Table 1.

Scoring of the items requires a combination of direct observation and interviewing. Almost two-thirds of the items may be scored from direct observation of the mother-child dyad. All data were collected in the respondent's own home at a time when mother and infant were both present and the infant was awake.

Interobserver reliability was determined by having two women collect

data simultaneously and score it independently. There was 92% agreement on items thus obtained.

A measure of parental attitudes toward child rearing, Emmerich's adaptation of Schaefer and Bell's Parental Attitudes Research Inventory (PARI), was administered to 56 mothers of high-risk children at 6 months and 52 mothers of high-risk children at 18 months. Fifty responded to the attitudinal measure at both ages. Emmerich's (1969) version of the PARI consists of 11 scales which have substantial loadings on three major factors isolated in previous studies of this instrument. These factors are Authoritarian Control, Hostility-Rejection, and Democratic Attitudes.

In addition, the same sets of data were collected for a general population sample (GPS) of mothers and children seen when the children were 6 and 20 months old, the same general population sample described by Campbell and Ramey (1977). Fourteen mothers and children were randomly selected from the birth records of Orange County, North Carolina. The sample was reflective of the general population in an academic community, that is, it had high educational and occupational status.

In this presentation, I want to describe to you the comparison between the three groups--the experimental, the control, and the general population sample--for each of the domains of data, and then examine the patterns of change across time for each group, and finally explore the relationship between these maternal variables and child status when the child is 3 years of age for the Frank Porter Graham sample.

In the laboratory observations of dyadic interaction, multivariate

analysis of variance indicated that the general population sample differed significantly in its behavior during the session from the Frank Porter Graham sample at both 6 and 20 months. GPS mothers were more likely to talk to their 6-month-old infants than either FPG experimentals or controls and they were involved in more mutual interaction with their infants. The FPG experimentals and controls differed significantly on one dimension--the experimental children played alone less during the session than controls.

During the 20-month observation session, the general population sample mothers continued to talk more to their toddlers; there was more mutual interaction during the session and their children were allowed to play alone less. Once again the interaction patterns of experimental and control dyads were roughly the same.

Group differences were also obtained on the Home Stimulation Inventory. Analyses of variance of the 6 HOME subscales assessed at 6 months indicated that the general population sample had significantly higher scores than the other two groups on each subscale. There were no significant differences in the home environments of the two FPG groups.

At 18 months the homes of general population sample mothers continued to be rated significantly higher than the FPG control group. However, on the scales of maternal warmth and organization of the environment, the FPG experimental group was not significantly different from the GPS; they were significantly higher than the control group on both.

The general population sample differed from the FPG experimental and control groups in their attitudes as well. Analyses of variance

indicated that at both 6 and 18 months they scored as less authoritarian, as having democratic attitudes and also as more hostile and rejecting. (The hostility and rejection factor of the PARI includes scales labeled irritability, marital conflict and rejection of the homemaker role and may be more a measure of liberated female status than the factor label implies.)

The changes across time for the three groups in each of these domains is quite similar except for the interaction session observed in the laboratory. On the Home Stimulation Inventory mothers became warmer but also more punitive toward their toddlers; they provided more toys for them but were also less involved in their play. As their children grew older all three groups of mothers described themselves as less authoritarian, more hostile and rejecting and more democratic.

The interaction sessions in the laboratory deserve more attention because there the changes across time were not parallel for the three groups. Factor analyses with varimax rotation to orthogonal structure yielded a principal factor at both the 6- and 20-month observation which accounted for 35% of the variance. It is a bipolar factor which includes mother talking to and interacting with her infant at the positive end and mother reading to herself and the child playing alone at the negative end.

Figure I illustrates the comparison of the three groups of mother-child dyads by the proportion in each group whose score on this factor is positive, that is whose behavior in the laboratory is more interactive than noninvolved. In the 6-month session, there is no significant difference between the groups on this first factor. Figure I shows that

57% of the general population sample scores on the positive end while 50% of the experimental and 42% of the controls score as being positively involved. However, when one looks at the interactions observed at 18 months in the laboratory, there are substantial differences on this first factor of involvement. At 18 months, 86% of the GPS score positively on this factor whereas the proportions for the experimental and control groups are much lower. The general population sample is significantly more interactive than the experimental group and, although the proportion of mothers scoring as interactive is higher for the experimental group, the difference in the factor scores for the two FPG groups is not significant.

What is presented here is a picture of attributes about mothers which are clearly different for poverty mothers and middle class mothers. Moreover, a pattern of interaction is obtained, at least in the laboratory observations, to suggest that behavioral interactions of advantaged and poverty mothers are more different with their toddlers than they are with their infants. It is interesting to note from the Campbell and Ramey presentation that the 18-month Bayley test score is the one marked by the precipitous drop in the untreated control group.

In an attempt to determine maternal behavioral predictors within the poverty group which are related to child status, we performed a series of multiple regressions (using the backward elimination technique), with the Stanford-Binet score from the 36-month testing as the criterion variable and maternal behaviors as the predictor variables. If one treats the entire FPG sample as a poverty group undifferentiated by experimental and

control, maternal variables account for about 35% of the variance in the 36-month Binet scores whether one predicts from 6-month or 18-month information about the mothers.

However, multiple regression analyses performed for the two FPG groups separately demonstrate that quite different information about the mothers is predictive of later status for the experimental and the control children. For the control children, one can reliably account for 63% of the variance in the Stanford-Binet scores at 36 months through a combination of maternal variables taken at 6 months from the laboratory observations, the Home Stimulation Inventory and maternal attitudes and including prenatal information. For the experimentals, a different combination of variables yields reliable predictability of 51%. Predicting from information gathered closer in time--maternal variables from prenatal information and the same three domains of data but taken at 18 months--the level of reliable predictability goes up for both groups--to 53% for the experimentals and to 82% for the controls. It is important to remember that these regression analyses were done on maternal variables alone. The child's previous developmental status is not included.

In order to examine in detail the variables which are leading to these high predictions, I am going to restrict my discussion to those variables in each regression model at the point when all variables in the model were significant.* Table 2 summarizes these variables at each

* The overall R^2's are somewhat lower for these sets of variables than the R^2's reported on the previous page which were obtained when the regression model as a <u>whole</u> became significant.

age. The R^2's indicate the percentage of variance accounted for by the inclusion of the set of variables listed. In general, it appears that at 6 months measures taken in the laboratory are somewhat more predictive of later status than are measures taken in the home for both groups. By 18 months the home measures become more predictive for the control children than they were at 6 months. Note also that maternal IQ is a substantial predictor for the control children, whether predicting from 6 or 18 months, but that it is not for the experimentals at either time.

To predict child developmental status at 3 years from information known about the mother when the child is 6 months, it appears that one must look for different attributes depending on whether the child is to be in an early intervention program or not. Experimental mothers likely to be facilitative of good development had democratic attitudes, were interactive and held their infants more in the laboratory observation, and had homes which were generally better organized. Control mothers who touched and talked to their infants more in the laboratory and who were brighter had children whose Binet scores were higher at 36 months.

As one might expect, given the changing nature of the mother-child relationship and the changing needs of the child as he develops, a different set of predictor variables is obtained from information gathered about the mothers when the children were 18 months old and related to the 36-month Binet. The set of these variables once again must be looked at independently for experimental and control children. The set of predictor variables for the experimental group mothers conveys a picture of a

mother who talks to her toddler during the interaction session, who is more accepting of the homemaker role (not hostile and rejecting on the PARI), and who has a more organized home.

The picture is not as clear when one examines the control mothers even though the combination of variables is highly predictive, accounting for 77% of the variance in Binet scores. These mothers are brighter and more involved with their children at home but they appear to be so in spite of a somewhat more impoverished situation--their high-risk index score is higher and there are fewer toys in the home. They allow their children to play alone more in the laboratory observation, but they do talk to their toddlers while the children play. They also score as having less democratic attitudes as measured by the PARI.

There are several conclusions to be drawn from these sets of regression analyses:

1. Daycare intervention alters the relationship between maternal variables and child status. Maternal variables are highly predictive of child status for the control group and less so for the experimental children.
2. Given the altered relationship between maternal variables and child status, predictive relationships must be established separately for the experimental and control groups. If treated as a single group of poverty children the factor most highly related to later status is not a maternal variable at all but their group assignment (Campbell & Ramey, 1977).
3. To understand the relationship between maternal variables and child status for a poverty group, one must sample data from a number of

different domains in order to obtain a more complete picture of the mother.

We have presented here a complex set of data and results, but the general conclusion is clearly that information about a mother's behavior and attitudes is extremely important for predicting her child's behavior ment. For too long research has remained at a level of allowing social class as a general term to carry explanatory weight. Clearly if one compared the FPG group as a set of poverty mothers to the general population their behavior would look uniform and significantly different. However, if one begins to look more closely within a lower socioeconomic group there are variables which are carrying differential predictive weight and one may begin to find some clues as to factors which identify those children who are likely to do well in spite of their background. The obvious caveat, of course, is that it is also very important to know about the environment in which the child is likely to develop. If it is a systematic daycare program such as the one at Frank Porter Graham, then different maternal variables may be important.

We are going to continue this line of research; the predictive relationships and the particular variables we found may change as our sample size increases. We have the opportunity with the information we have collected to begin to address the question not only of the effect of an early intervention program on children of poverty but, just as important, the mediators of the effects of poverty for children who remain untreated.

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FIGURE I

Comparison of FPG experimentals and controls and a general population sample on the percentage of involvement during laboratory observations at two points in time.

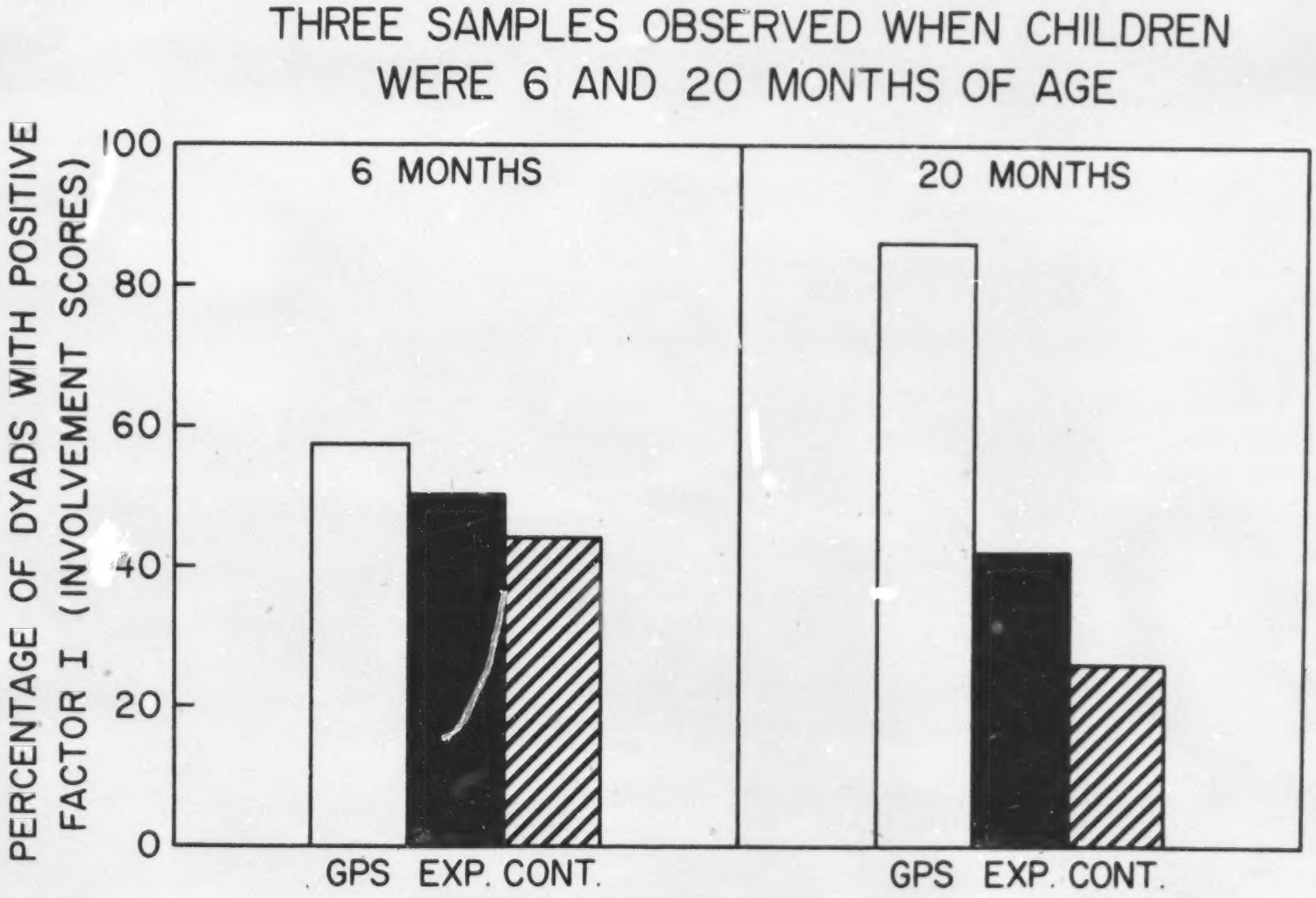
THREE SAMPLES OBSERVED WHEN CHILDREN WERE 6 AND 20 MONTHS OF AGE
PERCENTAGE OF DYADS WITH POSITIVE FACTOR I (INVOLVEMENT SCORES)
100
80
60
40
20
0
6 MONTHS
20 MONTHS
GPS
EXP.
CONT.
GPS
EXP.
CONT.

Table 1

MATERNAL VARIABLES
FOUR DOMAINS OF DATA

PRENATAL

1. Maternal IQ: Wechsler Adult Intelligence Scale or Wechsler Intelligence Scale for Children

2. High Risk Index

LABORATORY OBSERVATIONS
25 Minute Free Play Observation
at 6 and 20 Months

1. Maternal talk
2. Mother demonstrates toy
3. Mother touches child
4. Mother holds child
5. Mother interacts with child-mutual play
6. Mother reads to child
7. Mother reads to self
8. Child plays alone

HOME STIMULATION INVENTORY
Developed by Caldwell
Measured in the Homes at 6 and 18 Months

1. Maternal warmth and verbal responsivity
2. Avoidance of restriction and punishment
3. Organization of the physical and temporal environment
4. Provision of appropriate play material
5. Maternal involvement with the child
6. Opportunities for variety in daily stimulation

ATTITUDES
Parental Attitudes Research Instrument
Measured at 6 and 18 Months

1. Authoritarian control
2. Hostility - rejection
3. Democratic attitudes

Table 2

Multiple Regressions to the 36 Month Stanford Binet Score for the Frank Porter Graham Sample from Information Obtained on the Mothers at Two Points in Time

Mother Data Obtained When Children Were 6 Months

Experimentals		Controls	
R^2	Variables	R^2	Variables
	Democratic Attitudes (PARI)		Touch (Laboratory)
	Mutual Interaction (Laboratory)		Maternal IQ (Prenatal)
	*Hold (Laboratory)		Maternal Talk (Laboratory)
	Organization of Environment (HOME)		
.44	p .01	.50	p .001

Mother Data Obtained When Children Were 18 Months

Experimentals		Controls	
R^2	Variables	R^2	Variables
	Mother Talk (Laboratory)		Maternal Involvement (HOME)
	*Hostility-Rejection (PARI)		Maternal IQ (Prenatal)
	Organization of Environment (HOME)		*Provision of Appropriate Toys (HOME)
.52	p .001		*Democratic Attitudes (PARI)
			Child Play Alone (Laboratory)
			High Risk Index (Prenatal)
			Maternal Talk (Laboratory)
		.77	p .001

*Contributes negatively to the prediction.

Footnote

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